

IN THE CLAIMS:

The following is a complete listing of claims and replaces all prior versions and listings of claims in the present application:

Claim 1 (currently amended): A printing system for printing a print job comprising a number of pages, the system including:

a renderer software interface;

a receiving hardware interface for performing first coupling of incoming page description data, in the form of a display list, to [[a]] said renderer software interface[[;]], said renderer software interface being for performing first processing of the display list, [[to]] thereby to output a first processed display list; and rendering hardware, adapted to perform second processing of the first processed display list, [[to]] thereby to output raw pixel data,

wherein[[;]] said receiving hardware interface, the said rendering software interface, and the said renderer hardware are arranged to operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 2 (currently amended): A printing system according to claim 1, further comprising:

a host application for outputting at least one call defining said print job;

a printer driver for performing third processing of the at least one call, [[to]]
thereby to output page description data;

a host hardware interface for performing second coupling of said the page
description data to the said receiving hardware interface;

an interpreter, interposed between the said receiving hardware interface and
the said renderer software interface, wherein the said receiving hardware interface couples
said page description data to the said interpreter, said interpreter receiving and processing
the coupled page description data [[to]] thereby to output said the display list; and

a marking engine for generating an image on an output print medium for the
print job dependent upon said the raw pixel data,

wherein[[[:]]] said host application, the said printer driver, the said host
hardware interface, the said interpreter and the said marking engine are arranged to operate
in a pipelined manner, being thereby capable of concurrently processing job data from at
least one page of the print job.

Claim 3 (currently amended): A printing system according to claim 2,
wherein said the one call comprises a GDI call in a WindowsTM operating system.

Claim 4 (currently amended): A printing system according to claim 2,
wherein further comprising a spooler and a port monitor are interposed between the said
printer driver and the said host hardware interface, and a colour converter and an output
processor interposed between said rendering hardware and said marking engine, and

wherein[[:]] said spooler couples the page description data output from the said printer driver to the said port monitor, and,

the said port monitor couples the page description data output from the said spooler to the said host hardware interface, and wherein a colour converter and an output processor are interposed between the rendering hardware and the marking engine, wherein:

the said colour converter converts the raw pixel data being represented in a first colour space to converted raw pixel data being represented in a second colour space, said the converted raw pixel data being provided to the said marking engine instead of the raw pixel data, wherein and

said spooler, the said port monitor, and the said colour converter are arranged to operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 5 (currently amended): A printing system according to claim 4, wherein at least one of the said spooler and the said port monitor is implemented in software.

Claim 6 (original): A printing system according to claim 1, wherein said rendering hardware has a display list memory for storing the first processed display list.

Claim 7 (currently amended): A method of data processing for a printing system adapted for printing a print job comprising a number of pages, said method comprising steps of:

first coupling, by a receiving hardware interface, of incoming page description data to a renderer software interface in the form of a display list; performing first processing, by the renderer software interface, of the display list, [[to]] thereby to output a first processed display list; and performing second processing, by rendering hardware, of the first processed display list, [[to]] thereby to output raw pixel data, wherein[[:]] said first coupling, said first and said second processing steps ~~operate are performed~~ in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 8 (currently amended): A method according to claim 7, comprising further steps of:

outputting, by a host application, at least one call defining said the print job; performing third processing, by a printer driver, of the at least one call, [[to]] thereby to output page description data; second coupling, by a host hardware interface, said the page description data to the receiving hardware interface; interpreting, by an interpreter, the incoming page description data coupled from the receiving hardware interface, [[to]] thereby to output said the display list; and generating, by a marking engine, an image on an output print medium for the print job dependent upon said the raw pixel data,

wherein[[:]] said outputting, third processing, second coupling, interpreting and generating steps ~~operate~~ are performed in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 9 (currently amended): A method according to claim 8, wherein ~~said the~~ one call comprises a GDI call in a WindowsTM operating system.

Claim 10 (currently amended): A method according to claim 8, comprising further steps of:

third coupling, by a spooler, the page description data output from the printer driver to a port monitor;

fourth coupling, by the port monitor, the page description data output from the spooler to the host hardware interface;

storing, by a display list memory, the first processed display list for outputting to the rendering hardware;

converting, by a colour converter, the raw pixel data being represented in a first colour space to converted raw pixel data being represented in a second colour space, ~~said the~~ converted raw pixel data being provided to the marking engine instead of the raw pixel data,

wherein said third and fourth coupling steps, ~~the said~~ storing and ~~the said~~ converting steps ~~operate~~ are performed in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 11 (original): A method according to claim 10, wherein at least one .
of the spooler and the port monitor is implemented in software.

Claim 12 (currently amended): A computer readable medium [[for]] storing
a program for a print system adapted to print a job comprising a number of pages, said
program comprising:

code for a first coupling step [[for]] of coupling, by a receiving hardware
interface, of incoming page description data to a renderer software interface in the form of
a display list;

code for a first processing step [[for]] of processing, by the renderer
software interface, of the display list, [[to]] thereby to output a first processed display list;
and

code for a second processing step [[for]] of processing, by rendering
hardware, of the first processed display list, [[to]] thereby to output raw pixel data,
wherein[[::]] said code for the first coupling step[[,]] and said code for the
first and said second processing steps operate in a pipelined manner, being thereby capable
of concurrently processing job data from at least one page of the print job.

Claim 13 (currently amended): A computer program for a print system
adapted to print a job comprising a number of pages, said program comprising:

code for a first coupling step [[for]] of coupling, by a receiving hardware
interface, of incoming page description data to a renderer software interface in the form of
a display list;

code for a first processing step [[for]] of processing, by the renderer software interface, of the display list, [[to]] thereby to output a first processed display list; and

code for a second processing step [[for]] of processing, by rendering hardware, of the first processed display list, [[to]] thereby to output raw pixel data, wherein[[::]] said code for the first coupling step[[,]] and said code for the first and said second processing steps operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 14 (currently amended): A method of data processing for a printing system according to Claim 1, which comprises a sequence of pipeline processes, said method comprising, for a current pipeline process being said renderer software interface, steps of:

reading input data from an upstream pipeline process being said the receiving hardware interface; operating upon said the input data if an internal buffer of said the current pipeline process is not full; stalling said the upstream pipeline process, if said the internal buffer is full; and writing said the input data, having operated thereupon, to a downstream pipeline process being said the rendering hardware, if said the downstream pipeline process is not stalling said the current pipeline process.

Claim 15 (currently amended): method according to claim 14, wherein said operating step comprises at least one of:

processing ~~said~~ the input data; and

storing ~~said~~ the input data.

Claim 16 (currently amended): A method according to claim 14, wherein ~~said~~ the sequence of pipeline processes comprises at least one hardware process and one software process.

Claim 17 (currently amended): A method according to claim 14, wherein said operating step associated with each process in ~~said~~ the sequence of pipeline processes is performed substantially concurrently, by all processes in ~~said~~ the sequence.